

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A method of determining network routing information based on shared risk link group information in a data communications network comprising nodes and links, the method comprising the computer-implemented steps of:  
receiving information identifying a failed link in the network;  
receiving information defining one or more shared risk link groups to which the failed link belongs;  
each of the one or more shared risk link groups logically comprising two or more links, one of the two or more links being the failed link, and each link in a shared risk link group sharing a physical resource whose failure risks affecting all of the links in the shared risk link group;  
accessing a link state database that stores information defining one or more links and adjacent nodes;  
determining whether each link defined in the link state database is in the one or more shared risk link groups; and  
removing an adjacent node from the link state database for ~~any~~ a link other than the failed link that is determined to be in one of the shared risk link groups.
2. (Original) A method as recited in claim 1, performed as part of determining a shortest path through the network from a source to a destination.
3. (Original) A method as recited in claim 1, further comprising the steps of:  
determining whether a graph of the data communications network based on the link state database is disconnected; and

if the graph is disconnected, then determining a new shortest path through the network to a destination network element without removing any link that has not been explicitly reported by another network element as failed.

4. (Original) A method according to any of Claim 1, 2, or 3, further comprising the steps of:  
initiating a timer prior to the accessing step;  
when the timer expires, determining a new shortest path through the network to a destination network element.
5. (Currently Amended) A method of determining network routing information based on shared risk link group information in a data communications network comprising nodes and links, the method comprising the steps of:  
receiving information identifying a failed link in the network;  
receiving information defining one or more shared risk link groups  $[[S]]$  to which the failed link belongs,  
each of the one or more shared risk link groups logically comprising two or more links, one of the two or more links being the failed link, and each link in a shared risk link group sharing a physical resource whose failure risks affecting all of the links in the shared risk link group;  
determining the set of links S logically comprising all links belonging to the one or more shared risk links groups to which the failed link belongs;  
during computation of a shortest path first tree, after having added a node X to a path,  
adding each neighbor  $N_i$  of node X to a tentative tree if and only if a link (X,  $N_i$ ) does not belong to S.

6. (Currently Amended) A method of determining network routing information based on shared risk link group information in a data communications network comprising nodes and links, the method comprising the steps of:
- receiving information identifying a failed link in the network;
- receiving information defining one or more shared risk link groups to which the failed link belongs,
- each of the one or more shared risk link groups logically comprising two or more links, one of the two or more links being the failed link, and each link in a shared risk link group sharing a physical resource whose failure risks affecting all of the links in the shared risk link group;
- initiating computation of a shortest path first tree;
- adding a first node to a path as part of the computation;
- determining a set of neighbors of the first node; and
- adding each neighbor node to a tentative tree if and only if a link between the first node and the neighbor node does not belong to one of the shared risk link groups.
7. (Original) A method as recited in claim 6, further comprising the steps of:
- determining whether a graph representing the data communications network is disconnected; and
- if the graph is disconnected, then determining a new shortest path through the network to a destination network element without removing any link that has not been explicitly reported by another network element as failed.
8. (Original) A method according to any of Claim 6 or 7, further comprising the steps of:

initiating a timer prior to the accessing step;  
when the timer expires, determining a new shortest path through the network to a  
destination network element.

9. (Currently Amended) A computer readable medium storing one or more sequences of computer executable instructions for determining network routing information based on shared risk link group information in a data communications network comprising nodes and links in a data communications network having as elements links and nodes, which instructions, when executed by one or more processors, cause the one or more processors to perform
- receiving information identifying a failed link in the network;
- receiving information defining one or more shared risk link groups to which the failed link belongs,
- each of the one or more shared risk link groups logically comprising two or more links, one of the two or more links being the failed link, and each link in a shared risk link group sharing a physical resource whose failure risks affecting all of the links in the shared risk link group;
- accessing a link state database that stores information defining one or more links and adjacent nodes;
- determining whether each link defined in the link state database is in the one or more shared risk link groups; and
- removing an adjacent node from the link state database for ~~any~~ a link other than the failed link that is determined to be in one of the shared risk link groups.

10. (Currently Amended) A computer readable medium storing one or more sequences of computer executable instructions for determining network routing information based on shared risk link group information in a data communications network comprising nodes and links in a data communications network having as elements links and nodes, which instructions, when executed by one or more processors, cause the one or more processors to perform
- receiving information identifying a failed link in the network;
- receiving information defining one or more shared risk link groups  $[[S]]$  to which the failed link belongs,
- each of the one or more shared risk link groups logically comprising two or more links, one of the two or more links being the failed link, and each link in a shared risk link group sharing a physical resource whose failure risks affecting all of the links in the shared risk link group;
- determining the set of links  $S$  logically comprising all links belonging to the one or more shared risk links groups to which the failed link belongs;
- during computation of a shortest path first tree, after having added a node  $X$  to a path,
- adding each neighbor  $N_i$  of node  $X$  to a tentative tree if and only if a link  $(X, N_i)$  does not belong to  $S$ .
11. (Currently Amended) An apparatus for generating routing information based on shared risk link group information in a data communications network having as elements nodes and links, comprising:
- means for receiving information identifying a failed link in the network;

means for receiving information defining one or more shared risk link groups to which  
the failed link belongs;

each of the one or more shared risk link groups logically comprising two or more links,  
one of the two or more links being the failed link, and each link in a shared risk  
link group sharing a physical resource whose failure risks affecting all of the links  
in the shared risk link group;

means for accessing a link state database that stores information defining one or more  
links and adjacent nodes;

means for determining whether each link defined in the link state database is in the one or  
more shared risk link groups; and

means for removing an adjacent node from the link state database for any link other than  
the failed link that is determined to be in one of the shared risk link groups.

12. (Original) An apparatus as recited in claim 11, implemented as part of a means for  
determining a shortest path through the network from a source to a destination.

13. (Original) An apparatus as recited in claim 11, further comprising:  
means for determining whether a graph of the data communications network based on the  
link state database is disconnected; and  
means for determining, if the graph is disconnected, a new shortest path through the  
network to a destination network element without removing any link that has not  
been explicitly reported by another network element as failed.

14. (Original) An apparatus according to any of Claims 11, 12, or 13, further comprising:  
means for initiating a timer prior to the accessing step;

means for determining, when the timer expires, a new shortest path through the network  
to a destination network element.

15. (Currently Amended) An apparatus for determining network routing information based on shared risk link group information in a data communications network comprising nodes and links, the apparatus comprising:

means for receiving information identifying a failed link in the network;

means for receiving information defining one or more shared risk link groups  $[[S]]$  to  
which the failed link belongs,

each of the one or more shared risk link groups logically comprising two or more links,  
one of the two or more links being the failed link, and each link in a shared risk  
link group sharing a physical resource whose failure risks affecting all of the links  
in the shared risk link group;  
determining the set of links S logically comprising all links belonging to the one or more  
shared risk links groups to which the failed link belongs;

means for adding, during computation of a shortest path first tree, after having added a  
node X to a path, each neighbor  $N_i$  of node X to a tentative tree if and only if a  
link  $(X, N_i)$  does not belong to S.

16. (Currently Amended) An apparatus for determining network routing information based on shared risk link group information in a data communications network comprising nodes and links, the apparatus comprising:

means for receiving information identifying a failed link in the network;

means for receiving information defining one or more shared risk link groups to which  
the failed link belongs,  
each of the one or more shared risk link groups logically comprising two or more links,  
one of the two or more links being the failed link, and each link in a shared risk  
link group sharing a physical resource whose failure risks affecting all of the links  
in the shared risk link group;

means for initiating computation of a shortest path first tree;

means for adding a first node to a path as part of the computation;

means for determining a set of neighbors of the first node; and

means for adding each neighbor node to a tentative tree if and only if a link between the  
first node and the neighbor node does not belong to one of the shared risk link  
groups.

17. (Original) An apparatus as recited in claim 16, further comprising:

means for determining whether a graph representing the data communications network is  
disconnected; and

means for determining, if the graph is disconnected, a new shortest path through the  
network to a destination network element without removing any link that has not  
been explicitly reported by another network element as failed.

18. (Original) An apparatus according to any of Claims 16 or 17, further comprising:

means for initiating a timer prior to the accessing step;

means for determining, when the timer expires, a new shortest path through the network  
to a destination network element.



19. (Currently Amended) An apparatus for generating routing information in a data communications network having as elements links and nodes, the apparatus comprising: one or more processors;
- a network interface communicatively coupled to the processor and configured to
- communicate one or more packet flows among the processor and a network; and
- a computer readable medium storing one or more sequences of instructions for generating routing information which instructions, when executed by one more processors, cause the one or more processors to perform:
- receiving information identifying a failed link in the network;
- receiving information defining one or more shared risk link groups to which the failed link belongs,
- each of the one or more shared risk link groups logically comprising two or more links, one of the two or more links being the failed link, and each link in a shared risk link group sharing a physical resource whose failure risks affecting all of the links in the shared risk link group;
- accessing a link state database that stores information defining one or more links and adjacent nodes;
- determining whether each link defined in the link state database is in the one or more shared risk link groups; and
- removing an adjacent node from the link state database for ~~anya~~ any link other than the failed link that is determined to be in one of the shared risk link groups.
20. (Currently Amended) An apparatus for generating routing information in a data communications network having as elements links and nodes, the apparatus comprising:

one or more processors;

a network interface communicatively coupled to the processor and configured to

communicate one or more packet flows among the processor and a network; and

a computer readable medium storing one or more sequences of instructions for generating

routing information which instructions, when executed by one more processors,

cause the one or more processors to perform

receiving information identifying a failed link in the network;

receiving information defining one or more shared risk link groups  $[[S]]$  to which the

failed link belongs,

each of the one or more shared risk link groups logically comprising two or more links,

one of the two or more links being the failed link, and each link in a shared risk

link group sharing a physical resource whose failure risks affecting all of the links

in the shared risk link group;

determining the set of links  $S$  logically comprising all links belonging to the one or more

shared risk links groups to which the failed link belongs;

during computation of a shortest path first tree, after having added a node  $X$  to a path,

adding each neighbor  $N_i$  of node  $X$  to a tentative tree if and only if a link  $(X, N_i)$

does not belong to  $S$ .